consideration of the results of Morgan and Seeliger, and especially of those of Godlewski, would probably have modified the deduction drawn from Boveri's experiments on the fertilization of non-nucleated fragments of echinoderm eggs, as to the all-importance of the chromosomes in inheritance; and, similarly, no notice is taken of the work of Herbst and Doncaster, whose results antagonize those of Vernon on the influence of overripeness of the germ cells in the determination of the two parents in inheritance. But these and the few other imperfections that might be noticed do not interfere materially with the value of the book. It fulfils its purpose as an "introduction to the study of heredity" excellently well, it is rich in illustrative facts and judicious criticism, and is written in a style which is clear, consecutive, forcible and, at times, even picturesque.

It should be added that there is a good index, a bibliography of representative papers on heredity occupying forty-eight pages, and a very useful subject-index to the bibliography.

J. P. McM.

Mind in the Making. By Edgar James Swift, Professor of Psychology and Pedagogy in Washington University, St. Louis. New York, Charles Scribner's Sons. 1908. Pp. viii + 329.

Professor Swift's book is of real value to both investigators in educational psychology and students of college grade. The former class will find in it data of importance on the youthful delinquencies of people whose adult lives were decidedly above the average in conventional and probably in real morality, on the variability of intellectual achievement and on the influence of the knowledge of one or more foreign languages upon the learning of another. This last set of facts is especially important because it represents the cooperation of a teacher in service (Mr. William W. Hall, of the Yeatman High School in St. Louis) with a psychologist in an experiment conducted under class-room conditions. Such school-room experiments, comparable to the scientific work now being done in hospitals or on experimental farms, are a most hopeful sign that education is to be rationalized by science.

The data reported by Professor Swift support the conclusions: (1) that youthful irregularities in the way of theft, intemperance and the like are distributed amongst individuals continuously from a condition of complete lawlessness to that of complete "goody-goodyness," (2) that their presence then is consistent with a higher than average restraint from crime in adult life; (3) that individual differences in intellectual capacities are so great as to be of great practical importance, and (4) that the influence of training with one foreign language upon efficiency in learning another does not consist, to any considerable extent, in a subtle discipline of general mental functions. These conclusions, though doubtless acceptable to observant and matter-of-fact thinkers, have all been contradicted by theorists concerning education and by the practises recommended by leaders in educational administration.

Competent students of education in college classes and amongst teachers in service will profit by the study of these data and those repeated from Professor Swift's more familiar researches in the psychology of learning. For such the book contains also a descriptive account, with illustrative cases, of the influence of defects in vision, chorea, hysteria and the like upon education, a review of certain aspects of brain anatomy and physiology, a critique of the rigidity and narrowness of present curricula and methods of teaching, and a chapter on the nature of the educative process. All of these should be very useful.

The influence of the report of cases of eminent men and women who did not succeed in schools is more doubtful. It tends, probably without the author's desire, to give the impression that failure to achieve in school is a sign of success out of school and even that failure in early life is a sign of success later. The discussion of the criminal tendencies of boys may also, if taken too naïvely, lead to the expectation that juvenile delinquency is *per se* a healthy stage in a desirable

mental growth. Professor Swift, if I understand him, accepts neither of these conclusions, but he does not clearly deny them. Nor does he make clear the very complicated states of affairs of which the data given are but one aspect.

Concerning some of the conclusions which Professor Swift does definitely accept (such as: "*Every young child must be regarded as a potential genius,*" "*It is doubtful whether in three fourths of the cases criminal tendencies are anything else than a convenient name with which to cover our social sins and failures in education,*" "*Progress* [in the course of practise] *is never steady, but always by leaps*"), it must be noted that other intelligent investigators possessed of the same facts as the author would still not proceed to his conclusions. The ambiguities of units of mental measurement and the complexities of selective influences play too large a rôle in almost all our studies of human nature to leave any one's work exempt from revision and amendment.

The book is interesting throughout, partly because of the selection of topics and partly because the author possesses the admirable quality of writing to produce reactions in others rather than to express his own thoughts. The lack of an index should be remedied, especially since the book is a collection of essays whose separate titles can not at all adequately describe their contents.

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BOTANICAL NOTES

RECENT SYSTEMATIC PUBLICATIONS

THE fourth part of Dr. A. J. Grout's "Mosses with Hand-lens and Microscope" appeared late in April of the present year. It covers pages 247 to 318, and includes the completion of the family *Leskeaceae* and about half of the *Hypnaceae*. Twenty full-page plates, mostly from the Bryologia Europaea and Sullivant's Icones Muscorum, and thirty-two cuts serve to illustrate the text. The announcement is made that the closing part (V.) will be issued some time next year (1909). This closing part will complete the family *Hypnaceae*, and include analytical keys to sterile mosses, a list of errata, and a complete index. When the whole work is finished it will be a most useful addition to American bryological literature, and an indispensable aid to the beginner in the study of mosses. The fine quality of paper and the clear type and good presswork add much to the pleasure one experiences in using the book.

The problem of introducing the student to the work of identifying the plants about him is one which has puzzled botanical teachers not a little, especially since the introduction of laboratory studies has left little time for the old-fashioned preparation by the study of some such text-book as the old Gray's "Lessons" of our boyhood days. When this was used the pupil had nothing to do but to get ready for field work and the "classification" of flowering plants. That was all there was in botany. We had to run over the book in order to know how to "classify" the spring flowers when they appeared. We had to know the meaning of such words as cordate, ovate, spatulate, serrate, dentate, crenate, sepal, petal, introrse, extrorse, hypogynous, epigynous, dehiscent, indehiscent, orthotropous, anatropous, albuminous, exalbuminous, etc., for these were in constant use in the keys to the families and genera, and the descriptions of all botanical groups from divisions and classes to species and varieties. Thus long ago; but now-a-days after a longer or shorter course in laboratory botany where he has learned something of the evolution of the higher plants from the lower, he is sent to the fields with no previous instruction in the terminology of plant structures. He is told to "dig out" the identifications of the plants he finds by the aid of some manual of systematic botany. And it must be confessed, it is often pretty hard digging. The keys and descriptions are so technical as to be difficult of understanding, while the number of species described in the manual is so great as to bewilder and confuse the would-be botanist. Hence has arisen the demand for simple, local floras. By the use of non-technical descriptions it has been found